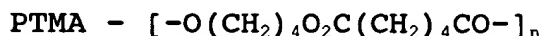


With respect to the rejections on the merits, the rejection of claims 1-4, 9, 11 under 35 U.S.C. §102(b) based on either Bradford, et al., (US 5,271,778) or Biddle, et al., (US 4,298,412) are presently believed to have been rendered moot in view of the present slate of claims.

The rejection of all the original claims under 35 U.S.C. §103(a) based on Bradford, et al., '778 in view of Chi., et al., (US 5,074,938), Willer (US 5,240,523), Fleming (US 5,583,315), Biddle, et al., '412 and Elrick (US 4,462,848) is respectively traversed. Each of the present claims is believed to distinguish over any combination of these references for the reasons that follow and others.

Bradford, et al., the primary reference, is directed to eliminating chlorine from a double based rocket propellant. Bradford, et al., may teach aspects of the broader concept by describing the use of polyether or polyester-based polymers, including co-polymers, in a binder. That reference also discloses polymer to plasticizer ratios less than 1.6:1 and discloses polyglycol adipate (PGA). However, Bradford, et al., clearly do not teach the use of PTMA (below) let alone recognize the attributes of higher molecular weight PTMA, i.e. much better elongation. Note also that Example I at column 3, line 57, calls for a "low molecular rate"(sic weight?)PGA. Specific numbers are not used, but the reference appears to clearly teach away from the present invention.

None of the references recognize the particular application of rather high molecular weight, poly(tetramethylene adipate) (PTMA). In regard to the compounds themselves the applicant recognizes that when it comes to polymers, in particular, there are often many different ways to describe the same material. With respect to the Chi., et al., reference, (Column 5, line 1-19), for example, it is the stated position of the Examiner that poly(diethylene glycol) adipate (PGA), at line 6-8, is another way of reciting the poly(tetramethylene glycol) adipate (PTMA) of the invention. It is the applicant's position that this is not the case. Structural representations are:



Thus, PGA does not describe PTMA and this is one reason that the specification at page 9, line 2, further lists the chemical abstract service (CAS) registry number of the preferred compound.

Whereas the Elrick reference does list a number of polyester diols which can be employed in the initial broad listing of possible binders for his propellant and mentions butylene glycol and polyesters prepared by reaction of butylene glycol with adipic acid which have structures similar to PTMA, in that list Elrick, however, like the others does not utilize that compound in any example, nor does he discuss the other attributes which might lead one to utilize that compound at all, let alone lead one to discover the attributes of particular molecular weight ranges. Examples use PGA of about 2,400 and of about 4,000

molecular weight. Note that his examples have elongations ranging from about 26 to about 42%. This is clearly far below the elongations achieved in the examples of the present invention as noted by the tensile properties of the various tables.

Willer does not mention PTMA but does describe general polymer molecular weights being from about 2,000 to 20,000. Clearly Willer does not recognize that superior mechanical properties are available with higher molecular weights of PTMA and provides no motivation at all for anyone to attempt to use PTMA let alone higher molecular weight PTMA. Willer does mention PGA.

Davis '890 deals with a solid polyurethane propellant binder composition and discusses the use of polyesters or polyethers or mixtures thereof as polyols used in the polyurethane binder composition. He further mentions polyesters made from butane-1,4-diol and adipic acid, which also describes (PTMA), however, he specifies that "[P]olyesters having molecular weights from about 500-3,000 and those that are affective and those having molecular weights from about 1700-2000 are particularly effective in preparing polyurethane propellant binder." This shows a preference to the mid-range fraction. The reference does not recognize any particular attributes ascribable to PTMA nor does it an anyway disclose any attributes higher molecular weight materials might have.

Thus, several of the references disclose PGA including Willer, Fleming, Biddle, Elrick, which is a different material.

Those that mention PTMA or compounds which may be interpreted to be PTMA including Elrick, and Davis, do not recognize the advantages that might be gained utilizing PTMA at all, let alone higher molecular weight PTMA that have been discovered in the present invention. Thus, not only do the references taken either singularly or in combination not recognize the particular importance of molecular weight of the PTMA, they fail to teach or motivate one to use PTMA in the formulations at all. This being clearly the case, the amount of experimentation necessary to conceive of the present invention is clearly inventive and far beyond the scope of any optimizing allowed by the court In Re Bosche, or In Re Aller cited by the Examiner.

In view of the above amendments taken together with the remarks herein, the applicant believes his present claims to patentably distinguish over the references cited taken either singularly or in combination and reconsideration and allowance of the claims is respectfully requested.

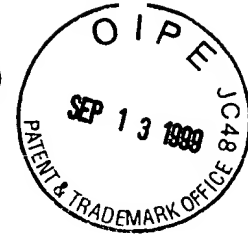
Respectfully Submitted,

NIKOLAI, MERSEREAU & DIETZ, P.A.

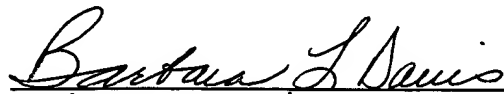


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**CERTIFICATE OF MAILING**



I hereby certify that the foregoing Amendment in response to the Official Action of July 8, 1999, in application Serial No. 09/088,163, filed on June 1, 1998, of John R. Moser, Jr., entitled "REDUCED ENERGY BINDER FOR ENERGETIC COMPOSITIONS" is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, postage prepaid, on September 10, 1999.

  
Barbara L. Davis  
on behalf of C. G. Mersereau  
Attorney for Applicant

Date of Signature: September 10, 1999